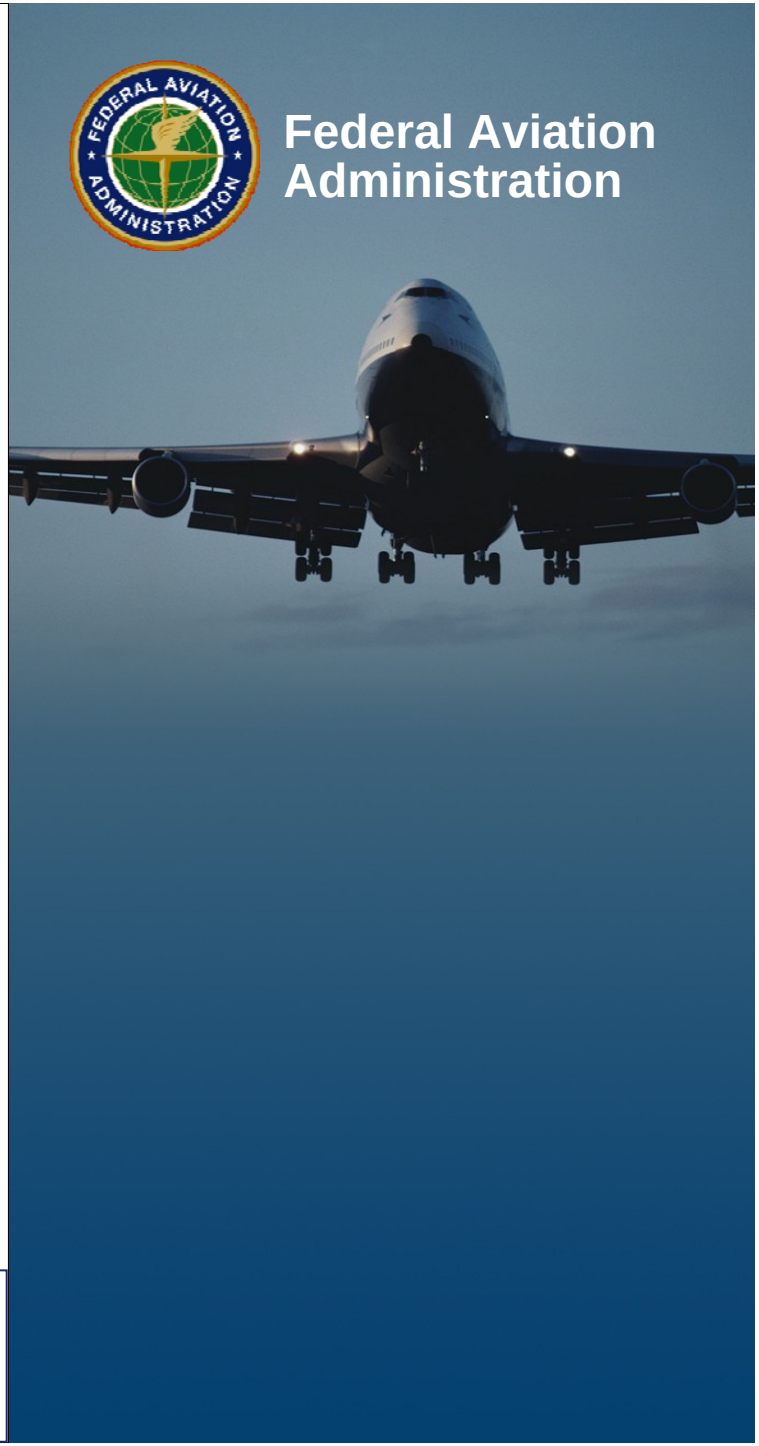
Atlanta NextGen PBN Activities



Presentation to: EWG Ops SC Meeting

Name: Jim Arrighi
RNAV/RNP Group
Jim Allerdice
A80

Date: May 18, 2010

Atlanta Performance Based Navigation Project Planning

- Seven elements to Atlanta PBN projects:

1. RNAV/RNP Dependent and Independent Approaches to Parallel Runways
2. RNAV Visual Approaches to all runways
3. RNAV Standard Instrument Departures (SIDs) + option
4. RNAV Standard Terminal Arrivals (STARs)
5. RNAV/RNP Radius to a Fix (RF) turns to Final Approach Course
6. RNAV/RNP Transitions to Instrument Landing System (ILS) Final Approach Courses
7. RNP Radius to a Fix (RF) Special SID

Atlanta Performance Based Navigation Project Planning

RNAV/RNP Dependent and Independent Approaches to Parallel Runways

- Allows use of public RNAV and RNP instrument approach procedures for parallel dependent and simultaneous independent ILS/MLS operations.
  - Each runway at Hartsfield-Jackson Atlanta International Airport is served by an ILS, ILS/PRM, RNAV (GPS) Y, and an RNAV (RNP) Z SAAAR approach, but cannot use them in combination
  - Key TF5 PBN functionality needed for operations throughout the National Airspace System as backup to the ILS or stand alone approach.
- Previously approved at Houston-Bush Intercontinental via waiver for use with RNP SAAAR procedures.
  - A proposed change, modeled after the Houston Waiver to allow use with public procedures, would implement the change to FAA Order JO 7110.65, Air Traffic Control.
  - This change would allow air traffic control personnel to use any combination of ILS, RNAV (GPS/RNP) approaches for parallel dependent and simultaneous independent operations to the dual/triple parallel runways. Additional consideration was given to LPV approaches as well.
- The Document Change Proposal (DCP) to allow parallel dependent and simultaneous independent approaches with all combinations of ILS/RNAV/RNP with vertical guidance was sent to the field for comment on April 30, 2010.

Atlanta Performance Based Navigation Project Planning

RNAV Visual Approaches to all runways

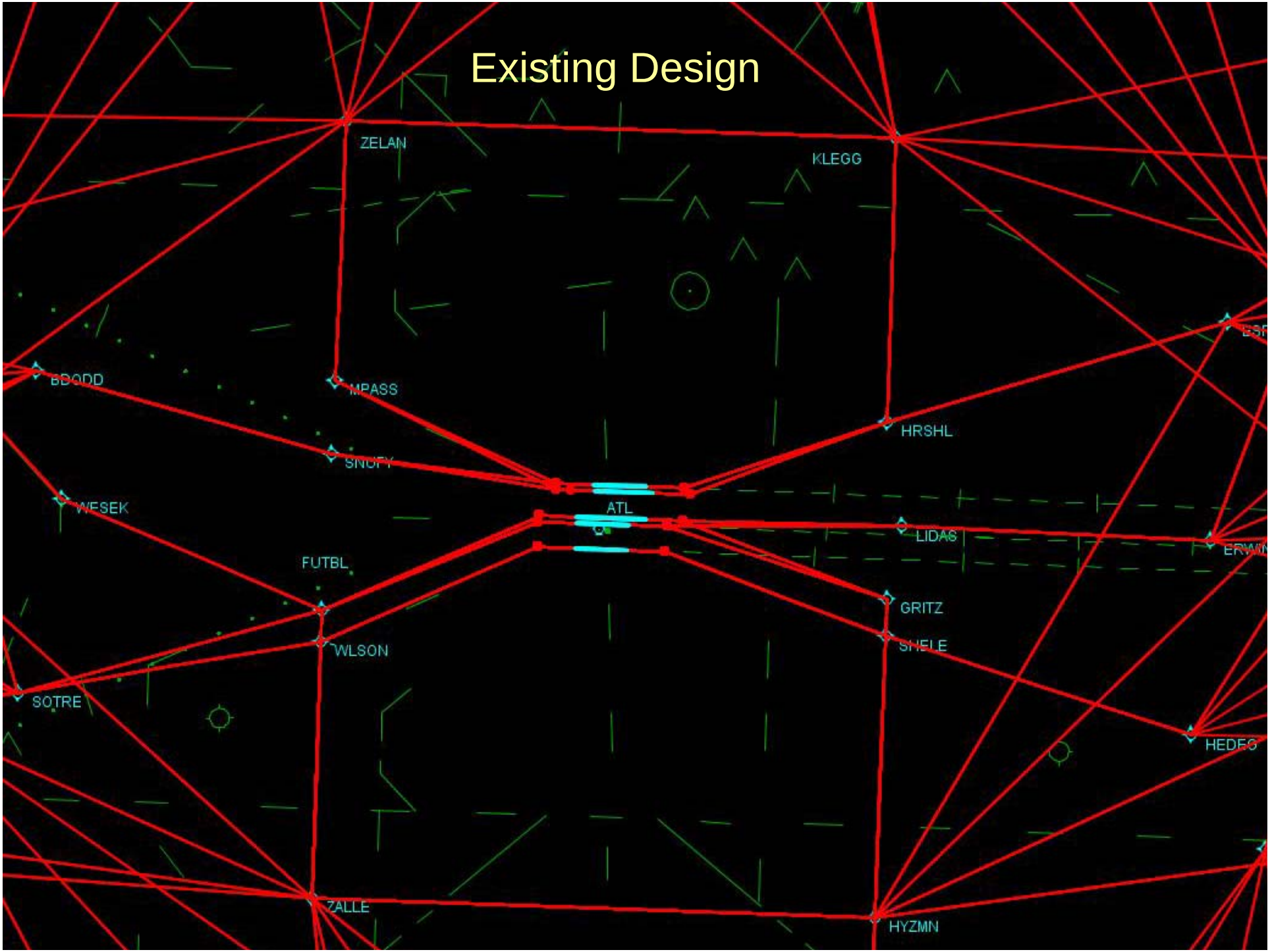
- Developed per Order 8260.55, *Special Area Navigation Visual Flight Procedures*
  - For use only by pilots of aircraft equipped with instrument flight rules (IFR)-approved RNAV systems.
  - The procedures are not “public” in nature, but are approved via a process similar to that of “special” instrument approach procedures (IAP).
  - RVFP are not “special IAPs” by definition but rather are simply considered “special procedures”.
  - A lead operator may design RVFP, through oversight by the Flight Standards Service (AFS) of the FAA. Others may become signatory.
- DAL is the lead carrier
- Concept is preparatory for development of RNP AR with RF legs
  - Ground tracks will mirror the RNP AR with RF proposal

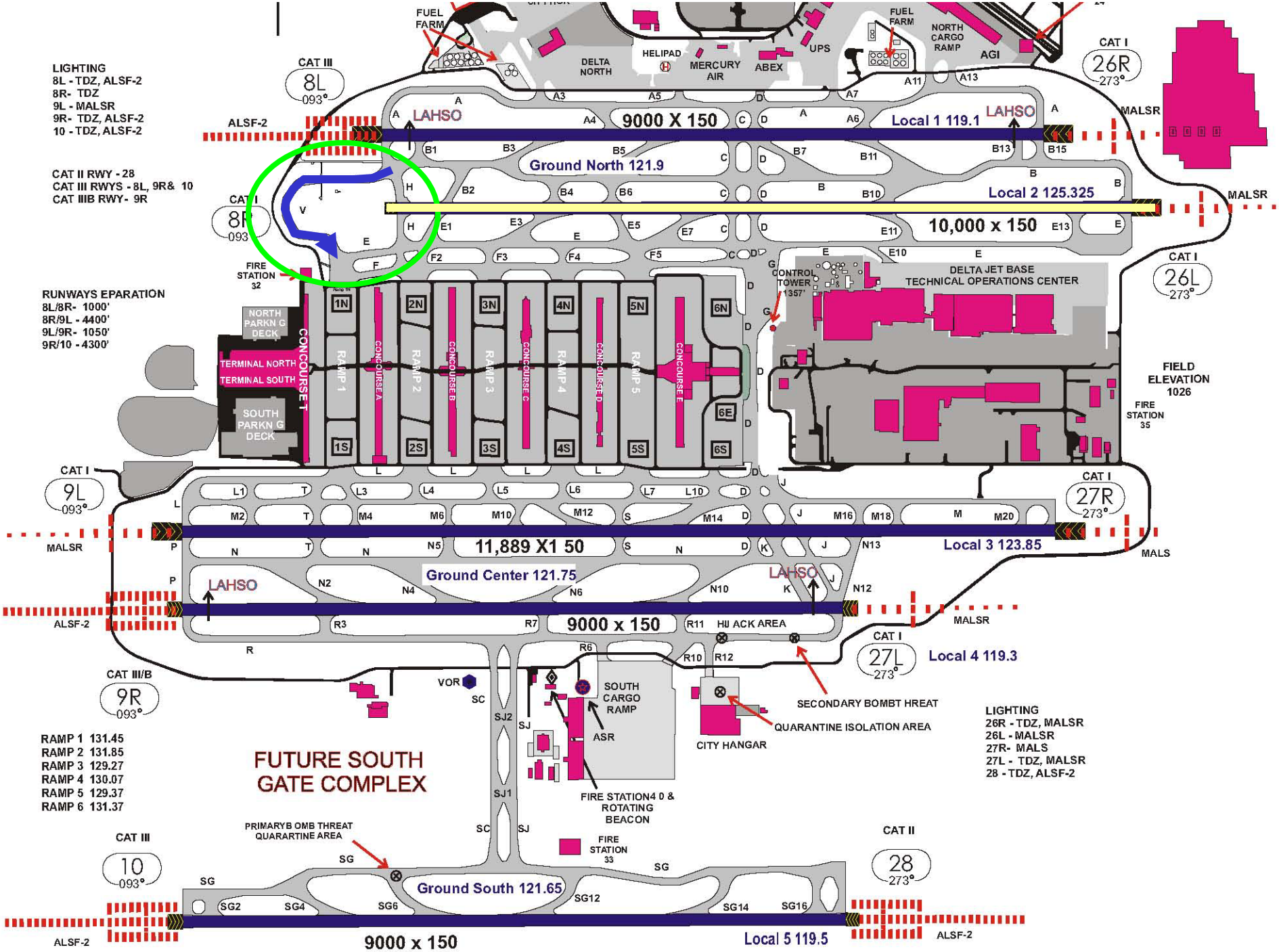
Atlanta Performance Based Navigation Project Planning

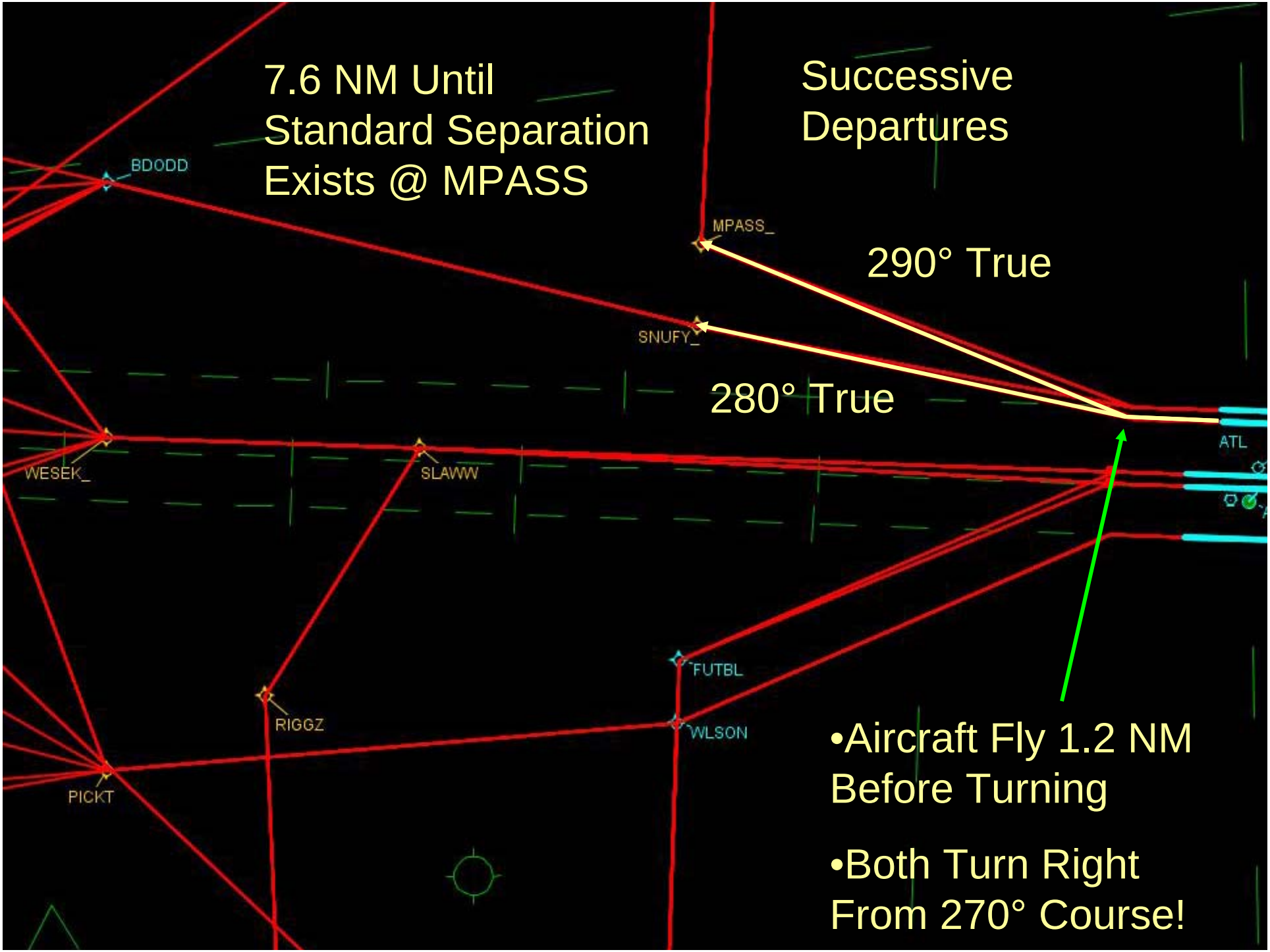
RNAV Standard Instrument Departures (SIDs)

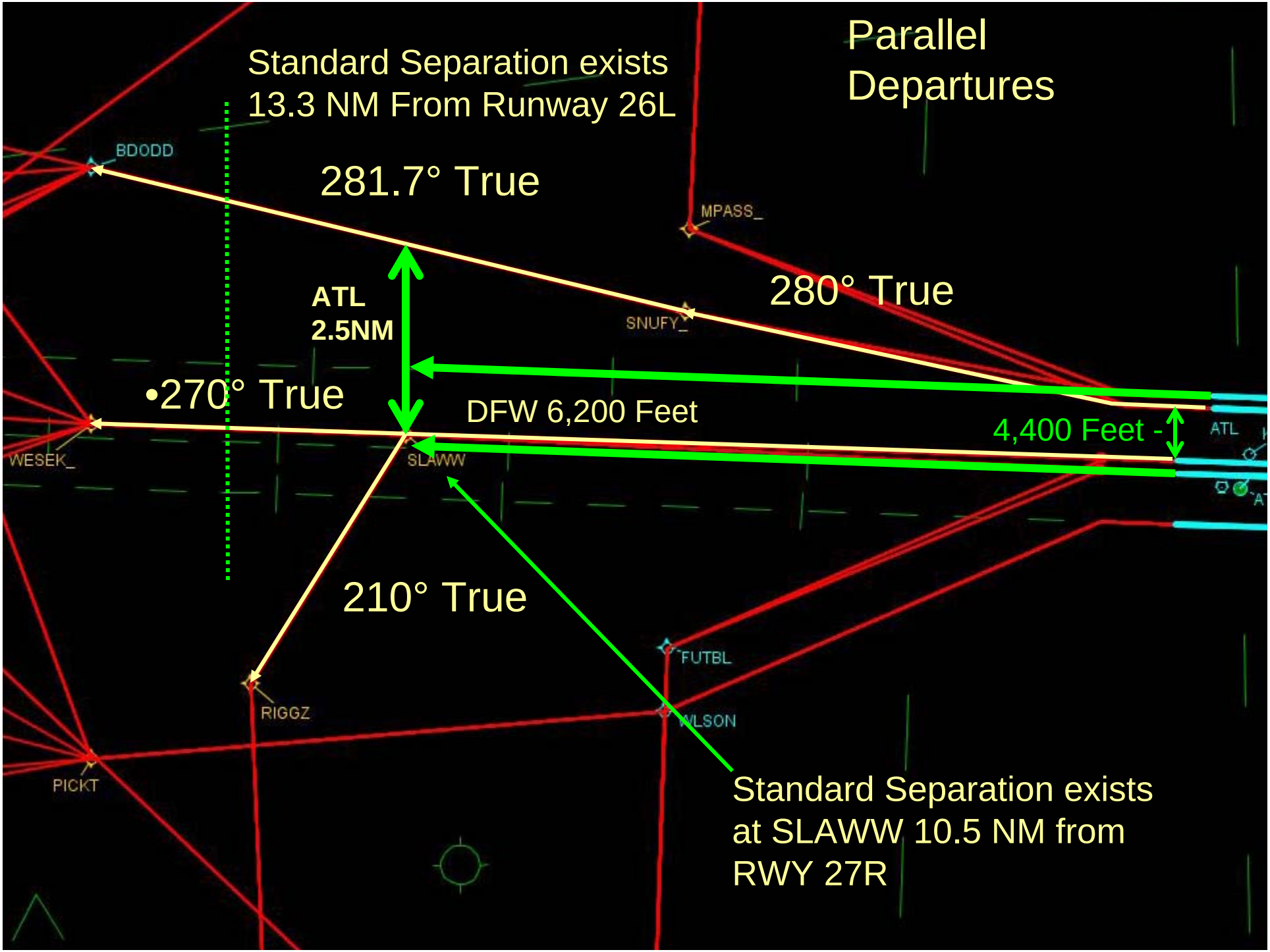
- Plan will use additional tracks to allow for triple RNAV OTG departures
  - Currently approved SID tracks do not allow for triple departures due to 15-degree divergence requirements.
  - When in triple departure configuration departures are radar vectored.
  - Requires switching back/forth between RNAV and RV departures.
- The RNAV SID plan will establish additional ground tracks, but will require a waiver for reduced divergence.
  - Requires 10- and 11-degrees in a west flow configuration
  - Requires 6- and 13-degrees in an east flow configuration
  - Divergence is immediate, and standard separation is achieved NLT 11.5 NM, as compared to DFW where departures can remain 6200 feet apart until divergence at 11 NM
- AFS450, Flight Simulation and Analysis Branch, is completing analysis of the proposal to support a waiver request.
  - The report was scheduled for delivery the week of May 2. Status?
  - An SRMD, procedure development and submission will follow.
  - Tentative pub date March 2011.

Existing Design

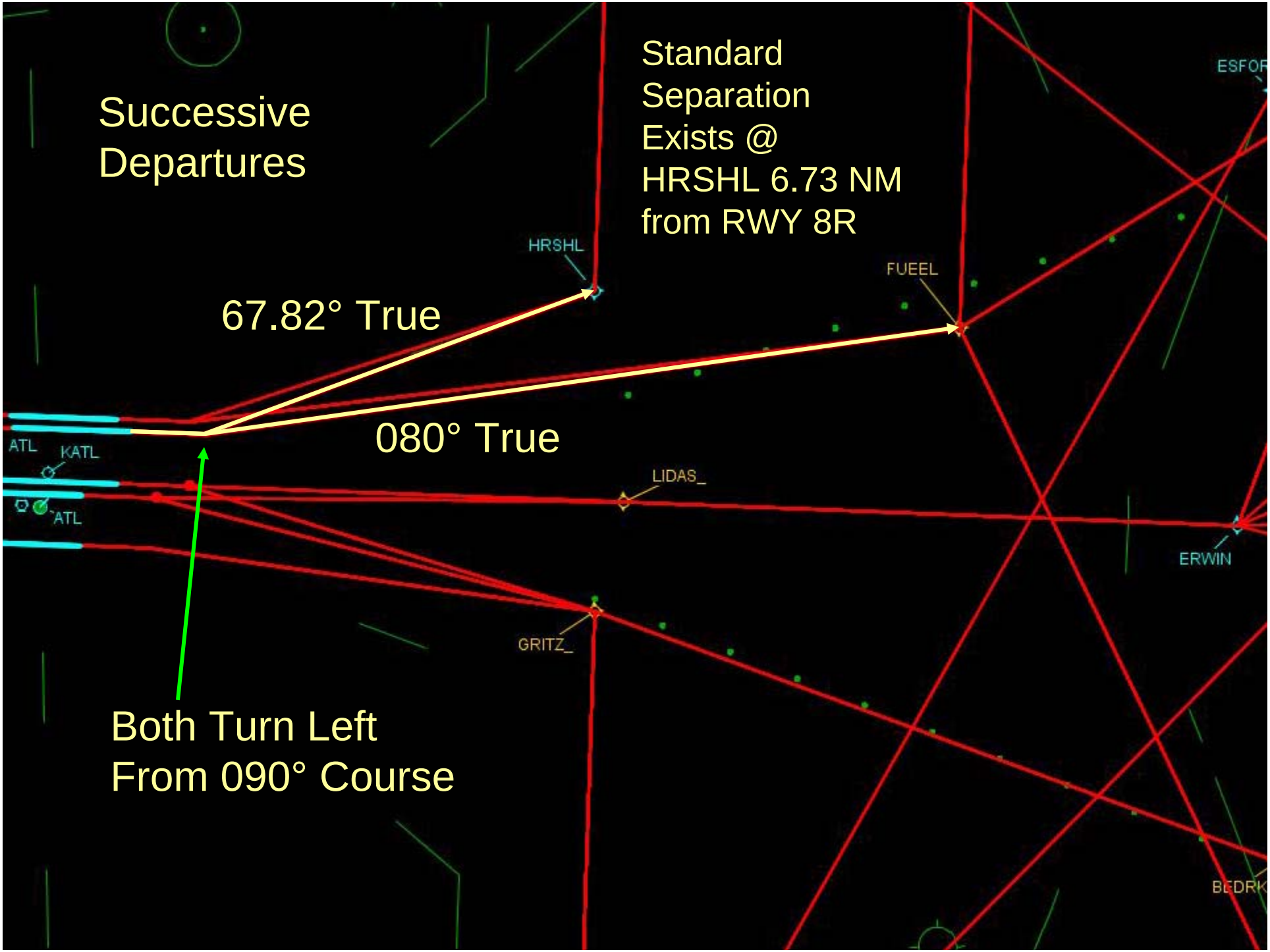


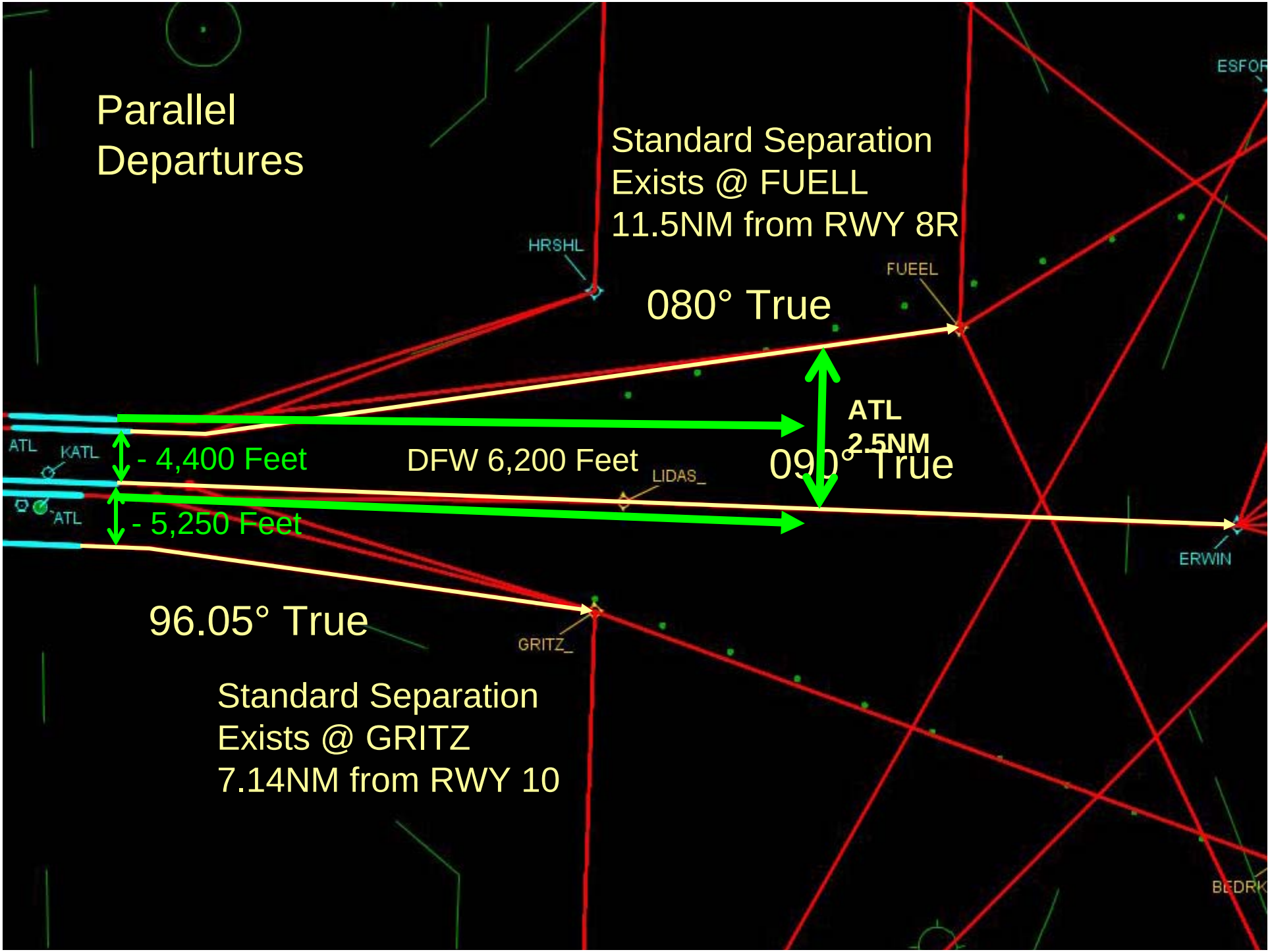

LIGHTING
8L - TDZ, ALSF-2
8R- TDZ
9L - MALSR
9R- TDZ, ALSF-2
10 - TDZ, ALSF-2
CAT II RWY - 28
CAT III RWYS - 8L, 9R& 10
CAT IIIB RWY- 9R
RUNWAYS EPARATION
8L/8R- 1000'
8R/9L - 4400'
9L/9R- 1050'
9R/10 - 4300'
RAMP 1 131.45
RAMP 2 131.85
RAMP 3 129.27
RAMP 4 130.07
RAMP 5 129.37
RAMP 6 131.37
FUEL FARM
DELTA NORTH
HELIPAD
MERCURY AIR
ABEX
UPS
FUEL FARM
NORTH CARGO RAMP
AGI
CAT III 8L 093°
CAT I 26R 273°
ALSF-2
LAHSO
9000 X 150
Local 1 119.1
MALSR
Ground North 121.9
Local 2 125.325
10,000 x 150
CAT I 8R 093°
CAT I 26L 273°
FIRE STATION 32
CONTROL TOWER 1357'
DELTA JET BASE TECHNICAL OPERATIONS CENTER
FIELD ELEVATION 1026
FIRE STATION 35
NORTH PARKN G DECK
TERMINAL NORTH
TERMINAL SOUTH
SOUTH PARKN G DECK
CONCOURSE T
CONCOURSE A
CONCOURSE B
CONCOURSE C
CONCOURSE D
CONCOURSE E
RAMP 1
RAMP 2
RAMP 3
RAMP 4
RAMP 5
CAT I 9L 093°
CAT I 27R 273°
11,889 X1 50
Local 3 123.85
MALS
Ground Center 121.75
9000 x 150
HU ACK AREA
CAT I 27L 273°
Local 4 119.3
CAT III/B 9R 093°
VOR
SOUTH CARGO RAMP
ASR
SECONDARY BOMBT HREAT
QUARANTINE ISOLATION AREA
CITY HANGAR
LIGHTING
26R - TDZ, MALSR
26L - MALSR
27R- MALS
27L - TDZ, MALSR
28 - TDZ, ALSF-2
FUTURE SOUTH GATE COMPLEX
FIRE STATION4 0 & ROTATING BEACON
PRIMARYB OMB THREAT QUARARTINE AREA
FIRE STATION 33
CAT III 10 093°
CAT II 28 273°
Ground South 121.65
9000 x 150
Local 5 119.5
ALSF-2


7.6 NM Until
Standard Separation
Exists @ MPASS
Successive
Departures
BDODD
MPASS_
290° True
SNUFY_
280° True
ATL
WESEK_
SLAWW
FUTBL
RIGGZ
WLSON
PICKT
•Aircraft Fly 1.2 NM
Before Turning
•Both Turn Right
From 270° Course!

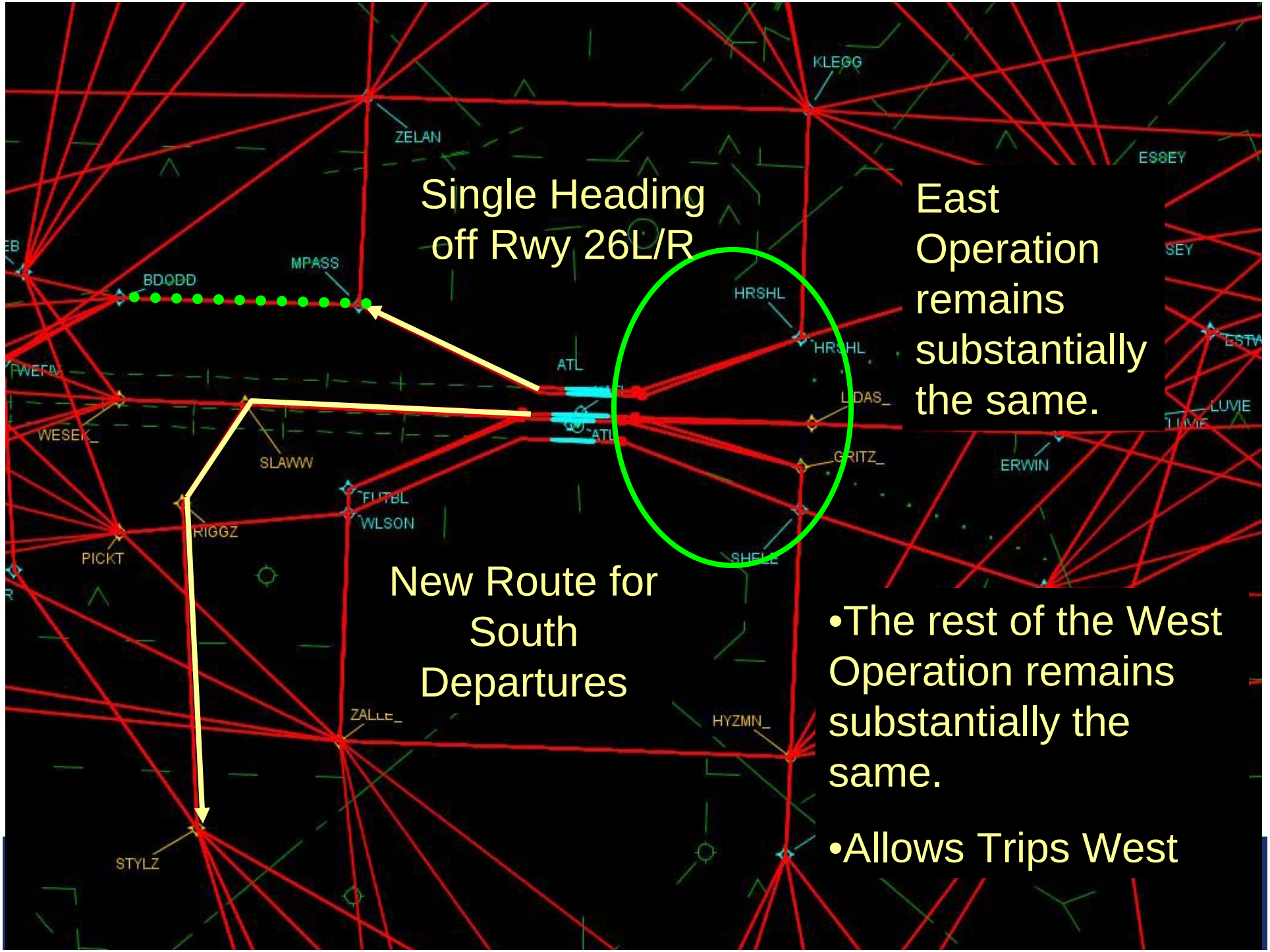

Parallel Departures
Standard Separation exists 13.3 NM From Runway 26L
281.7° True
BDODD
MPASS_
280° True
SNUFY_
ATL 2.5NM
•270° True
DFW 6,200 Feet
4,400 Feet -
ATL
WESEK_
SLAWW
210° True
FUTBL
RIGGZ
WLSON
PICKT
Standard Separation exists at SLAWW 10.5 NM from RWY 27R

All other runway/track combinations that are normally used in a West Operation are separated by 15° or more.


Successive Departures
Standard Separation Exists @ HRSHL 6.73 NM from RWY 8R
HRSHL
FUEEL
67.82° True
080° True
ATL
KATL
ATL
LIDAS_
ERWIN
GRITZ_
Both Turn Left From 090° Course


Parallel
Departures
Standard Separation
Exists @ FUELL
11.5NM from RWY 8R
HRSHL
FUEEL
080° True
ATL
2.5NM
090° True
ATL
KATL
- 4,400 Feet
DFW 6,200 Feet
LIDAS_
ATL
- 5,250 Feet
ERWIN
96.05° True
GRITZ_
Standard Separation
Exists @ GRITZ
7.14NM from RWY 10

All other runway/track combinations that are normally used in a East Operation are separated by 15° or more.

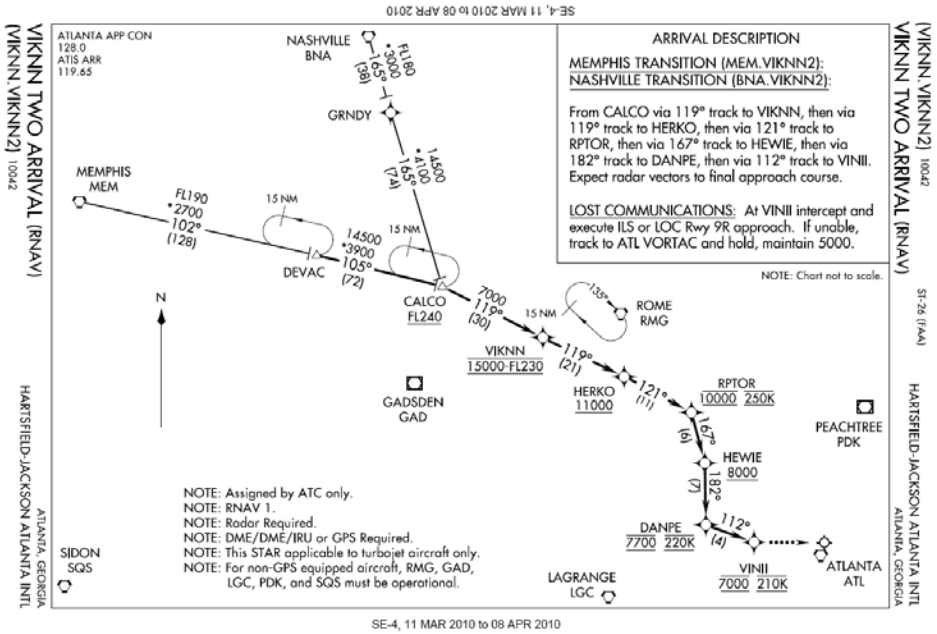

KLEGG
ZELAN
ESSEY
Single Heading off Rwy 26L/R
East Operation remains substantially the same.
MPASS
BDODD
HRSHL
ATL
LUVIE
ERWIN
SLAWW
FUTBL
WLSON
RIGGZ
PICKT
New Route for South Departures
HYZMN_
STYLZ
•The rest of the West Operation remains substantially the same.
•Allows Trips West

Atlanta Performance Based Navigation Project Planning

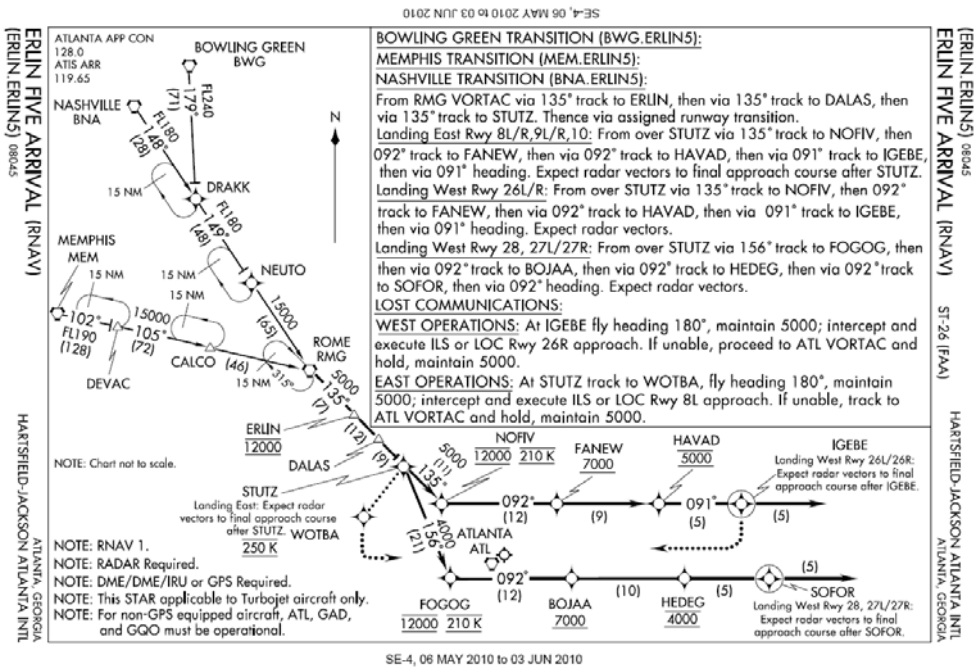
RNAV Standard Terminal Arrivals (STARs)

- Expansion of VIKNN RNAV STAR OPD project
  - Developed and tested in 2007/2008 based on the ERLIN RNAV STAR from MEM and BNA
  - Published in 2009
  - VIKNN is an east operation arrival. Connects to the 9R ILS at VINII
- Initial VIKNN testing was conducted (mid-night to 6:00 AM?) when in an East Operation
  - AirTran, ASA, Delta and FedEx participants
  - Proved benefits and procedure viability
  - Operational use has been problematic due metering (TMA) limitations and compatibility with the ERLIN RNAV STAR
- Workgroup convened March/April 2010 to expand ATL OPD effort
  - Target expanded demo of VIKNN use in Oct 2010
  - TMU work group meeting at ZTL May 2010 to tackle TMA metering challenges
  - Workgroup will reconvene in June 2010
  - Additional OPD arrivals under discussion; must resolve 24/7 VIKNN use first

Atlanta Performance Based Navigation Project Planning



SE-4, 11 MAR 2010 to 08 APR 2010



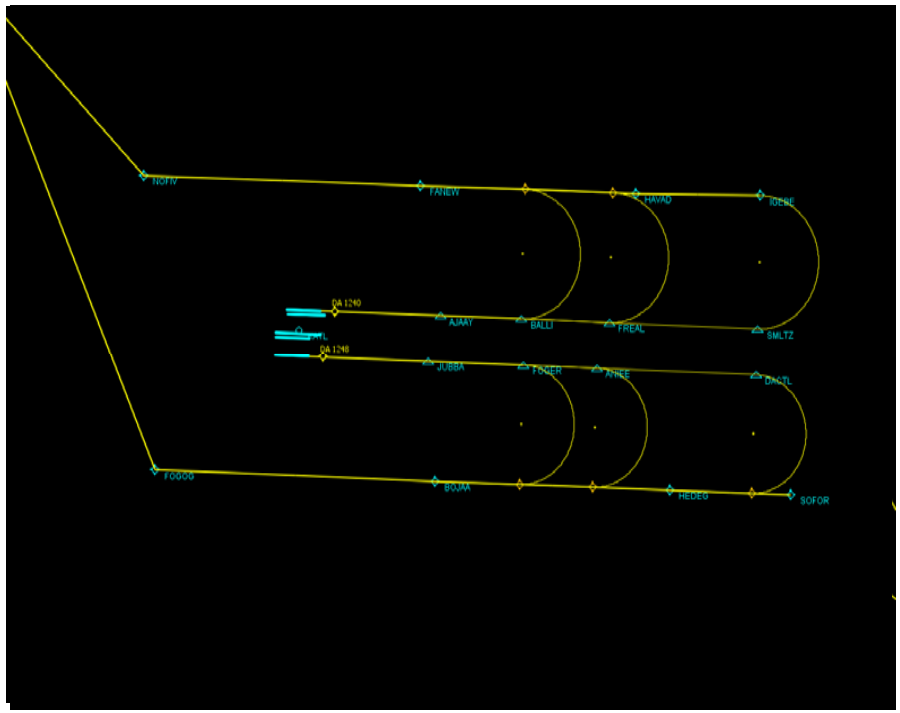
SE-4, 06 MAY 2010 to 03 JUN 2010

Atlanta Performance Based Navigation Project Planning

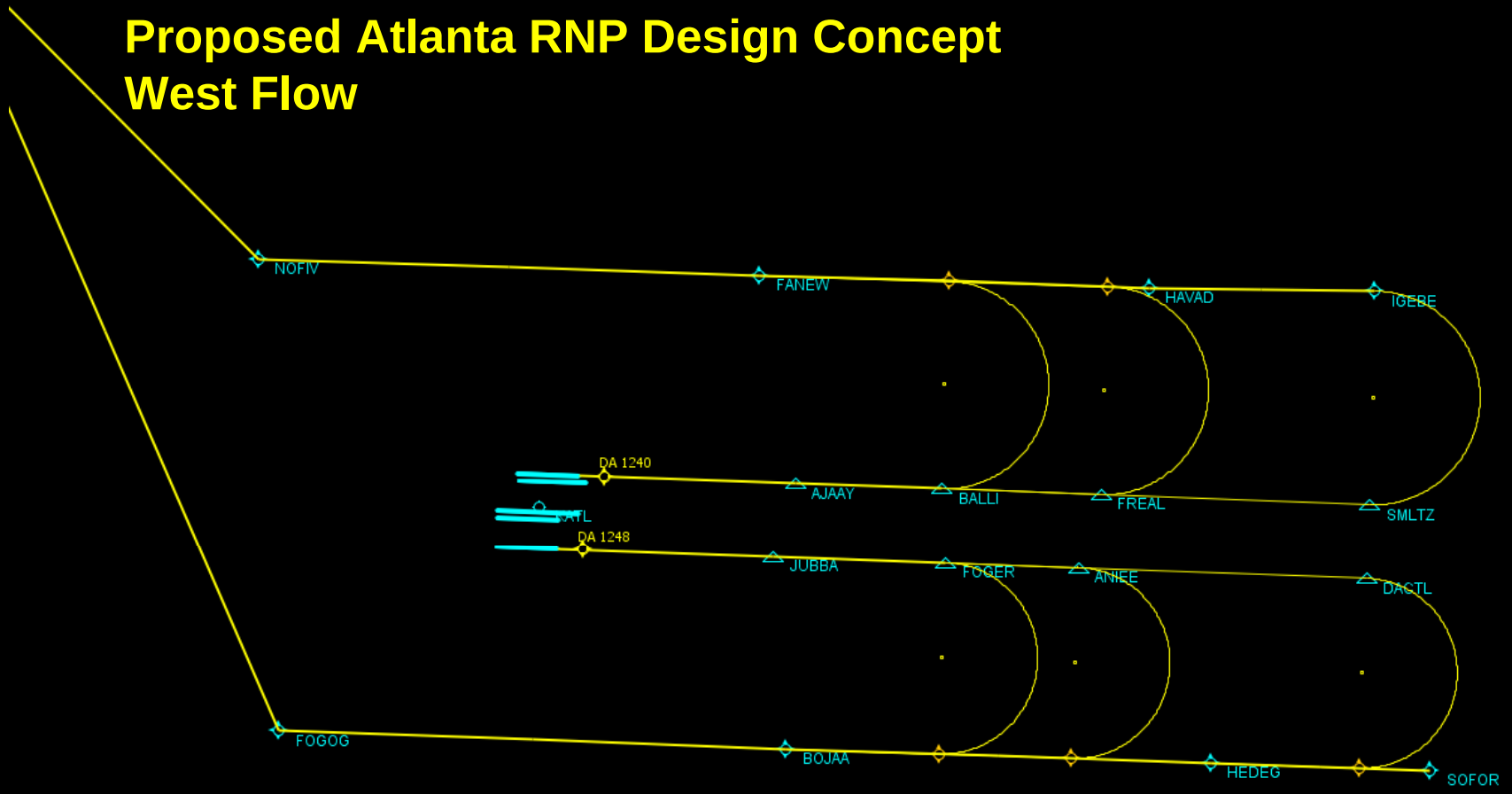
RNAV/RNP Radius to a Fix (RF) turns to Final Approach Course

- Project will design RF legs to connect the RNAV STARs to the RNP approaches.
- The RF leg synchronizes the downwind path to the final approach course. This path will be a transition on the
- PARC WG evaluation of where the aircraft is considered “established” on the RNP approach is ongoing.
  - The required 1,000’ vertical and/or 3nm separation may not apply and thus the aircraft will be allowed to fly a shorter path to the runway.
  - Simultaneous approach separation will be provided by the path containment and on board alerting of RNP coupled with an adjacent aircraft being established on the adjacent approach course.
- The objective is to increase safety in simultaneous operations, reduce mileage flown, and increase environmental and operational efficiencies.

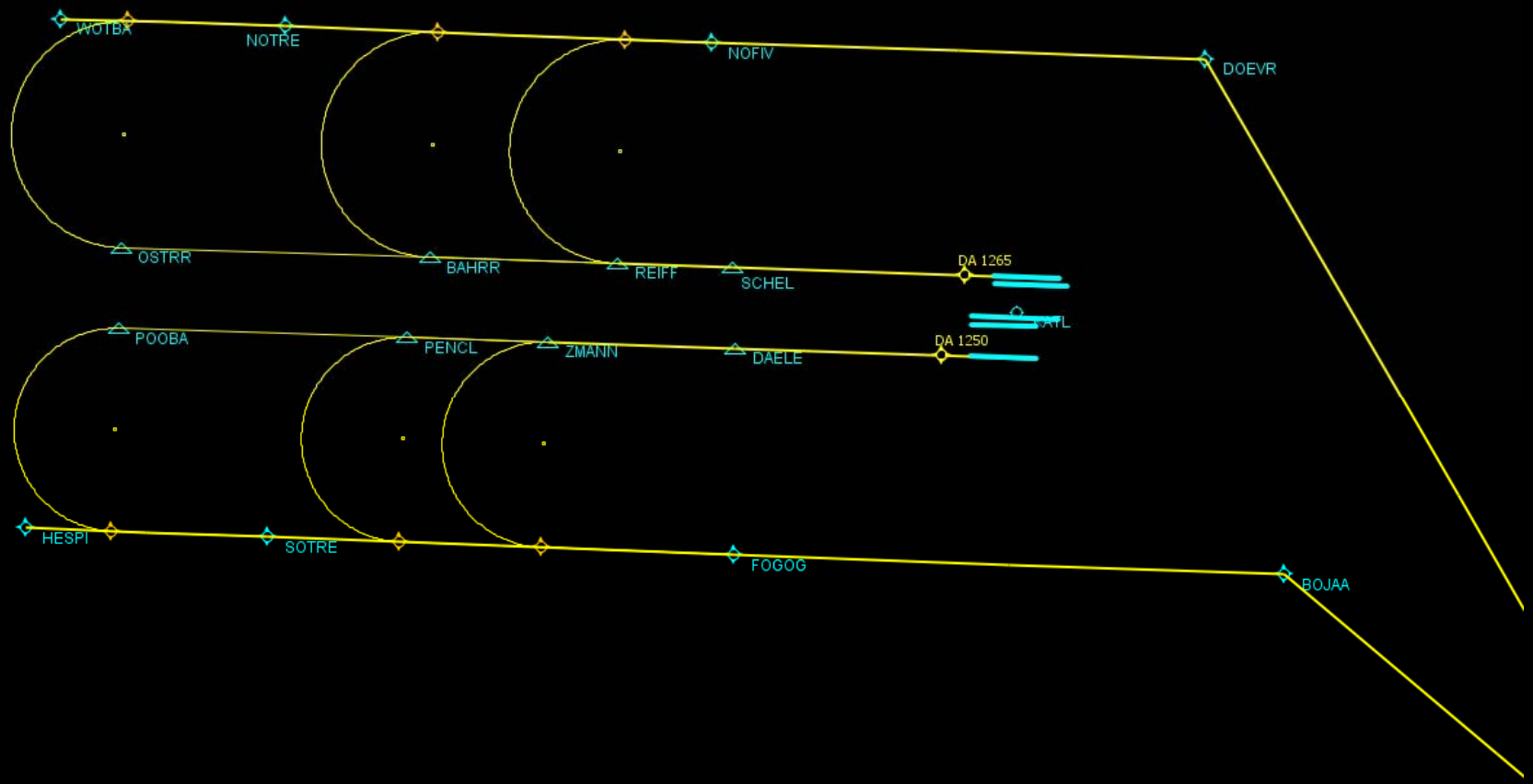
Multiple RF Legs



Proposed Atlanta RNP Design Concept
West Flow



Proposed Atlanta RNP Design Concept
East Flow



Atlanta Performance Based Navigation Project Planning

RNP Transitions to Instrument Landing System (ILS) Final Approach Courses

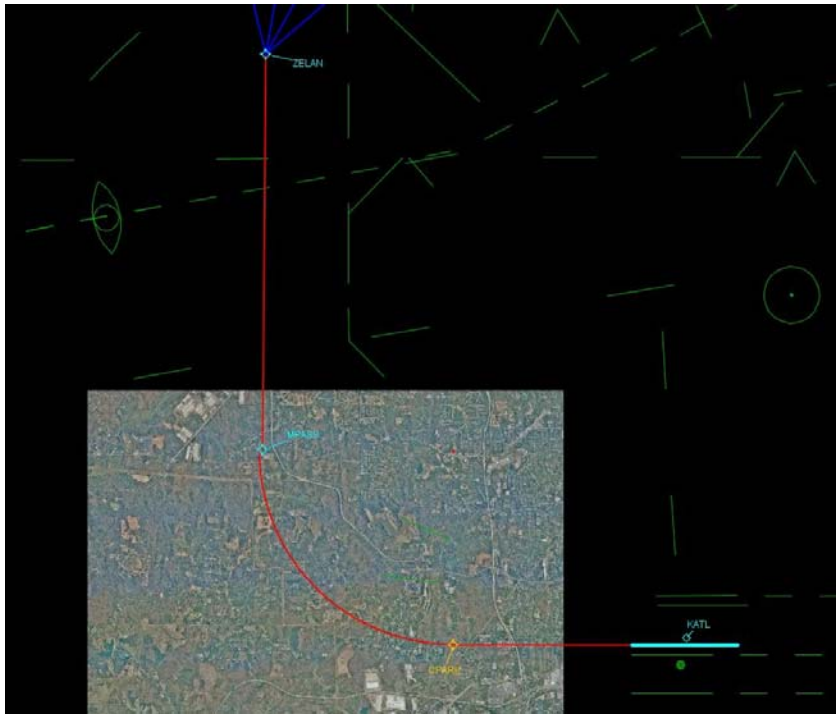
- Current separation criteria requires 3nm lateral or 1,000’ vertical during ILS turn on.
  - Can create final approach segments that are 20-22nm long in a triple ILS operation.
  - Once an aircraft is established on the localizer separation responsibility is transferred to ILS monitor controllers.
- The objective of this activity is similar to the RNP approach tied to the RNAV STAR, i.e, the aircraft is ‘established’ on the approach prior to intercepting the ILS localizer.
  - There are challenges associated with transitioning from an RNP procedure to the ILS, e.g., baro VNAV, multiple glideslope intercept points.

Atlanta Performance Based Navigation Project Planning

RNP Radius to a Fix (RF) Special SID

- Project will design RF legs on a departure procedure.
- Delta requested special departure procedure
- First application of an RNP departure with RF
- Services heavy aircraft departures to the north and avoids environmentally sensitive areas to the west

RNP with RF Leg



DELTA

Questions?